[JP,2001-220441,A]

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CLAIM + DETAILED DESCRIPTION

[Claim(s)]
[Claim 1] The polyamide composition characterized by for evaluation being V-0 and the quantity of the sodium ion measured by induction plasma emission spectrometry being 400 ppm or less in the combustion test which a fusing point does according to UL-94 specification including the aromatic polyamide which is 290 degrees C or more.
[Claim 2] The polyamide composition according to claim 1 characterized by consisting of repeating units characterized by providing the following Aromatic polyamide is 30-100mol of terephthal acid component unit %. The dicarboxylic acid component unit which consists of 0-70mol of aliphatic series dicarboxylic acid component unit % with 4-20 0-70mol of aromatic-dicarboxylic-acid component unit % and/or carbon atoms other than terephthalic acid The diamine component unit which consists of an aliphatic series diamine component unit and/or an alicycle group diamine component unit
[Claim 3] The polyamide composition according to claim 1 or 2 characterized by the limiting viscosity measured in 25-degree-C concentrated sulfuric acid being within the limits of 0.5 - 3.0 dl/g.
[Claim 4] The presentation of the following [polyamide composition] and the (A) fusing point are aromatic polyamide of 290 degrees C or more. 20 to 80 weight %, (B) Minerals reinforcement 0 to 60 weight %, (C) brominated flame retardants 5 to 40 weight %, And a polyamide composition given in any of the Claims 1-3 characterized by the sum total of one or more sorts of compounds [0.1 to 10 weight % of] chosen from the multiple oxide containing (D) zinc and the zinc salt of phosphoric acid, ********, and (above-mentioned A) +(B)+(C)+ (D) being 100 weight % they are.
[Claim 5] +(B)+ (C) (above-mentioned [A]) It is (E) cation adsorption mineral matter to a total of 100 weight parts of + (D). Polyamide composition according to claim 4 which adds 0.01 - 10 weight part and is characterized by things.
[Claim 6] A polyamide composition given in any of the Claims 1-5 characterized by the quantity of sodium ion being 200 ppm or less they are.

[Claim 7] The charge of connector shaping material which consists of a polyamide composition given in any of Claims 1-6 they are.
[Claim 8] The connector which consists of a polyamide composition given in any of Claims 1-6 they are.

[Detailed Description of the Invention]
[0001]
[Field of the Invention] About the fire-resistant polyamide composition excellent in the electrical property, especially in more detail, even if this invention is used for the bottom of high-humidity/ temperature, it relates to the fire-resistant polyamide composition which offers electricity and electronic parts, such as a connector excellent in the electrical property.
[0002]
[Background of the Invention] As polyamide, 6 nylon, 66 nylon, etc. are known widely conventionally. The demand of thermoplastic polymer with a high heat-resisting property increased in recent years, and 46 nylon was developed. Although this had a heat-resisting property higher than 6 nylon and 66 nylon, there was a fault that water absorption was also high.
[0003] On the other hand, the aromatic polyamide (JP,S59-53536,A) guided from aromatic dicarboxylic acid and aliphatic series alkylene diamines, such as terephthalic acid, was developed. Compared with aliphatic series polyamide, such as 66 nylon and 46 nylon, it this is not only further excellent in a heat-resisting property, mechanical hardness, and rigidity, but has the feature that water absorption is also low.
[0004] Since such aromatic polyamide burns easily like other thermoplastics, such as aliphatic series polyamide and polyolefine, it needs to blend a flame retarder with the use as which fire retardancy and flame resistance are required. It is the constituent (JP,S51-47034,A) with which how to add fire retardancy-ized agents, such as a halogenated compound, to polyamide is generally known, for example, halogenation polystyrene was added by polyamide, Or the constituent (JP,S56-2100,A) with which the condensation product of bromine-ized phenol was added by polyamide is known.
[0005] Moreover, in order to raise fire retardancy generally, fire-resistant assistants, such as antimony oxide, are blended with a halogen system fire retardancy assistant. However, it is known that it is also desirable to use not antimony oxide but sodium antimonate for high-melting point polyamide from a point of the processing stability in high temperature (JP,7-103309,B, JP,H8-19327,B).
[0006] Such a fire-resistant polyamide composition can be used as a connector etc. However, especially, it is used in the situation under outdoor high-humidity/temperature, and the appearance of the material which was still further excellent in electric insulation is required, holding fire retardancy, in order to use for the use as which high electric insulation is required.
[0007] The sodium hypophosphite with which such a fire-resistant polyamide composition was added as a polymerization catalyst of polyamide for us, The sodium compound which sodium phosphate and sodium antimonate which were added as a processing stabilizer disassembled and generated, the sodium compound which remains to brominated flame retardants, etc. are included. These sodium compounds reached this invention, as a result of ionizing when polyamide absorbs water, thinking that electric insulation etc. will be affected and inquiring wholeheartedly.
[0008]
[Objects of the Invention] This invention is made in view of the above conventional technology, and aims at offering a fire-resistant polyamide composition with few sodium compounds.
[0009]
[Summary of the Invention] In the combustion test which performs the fire-resistant polyamide composition concerning "concrete explanation of invention" this invention according to UL-94 specification including the aromatic polyamide whose fusing point is 290 degrees C or more,

evaluation is V-0. And it is characterized by the quantity of the sodium ion measured by induction plasma emission spectrometry being 400 ppm or less.
[0010] The aromatic polyamide used for this invention is with 30-100mol of terephthal acid component unit %, The dicarboxylic acid component unit which consists of 0-70mol of aliphatic series dicarboxylic acid component unit % with 4-20 0-70mol of aromatic-dicarboxylic-acid component unit % and/or carbon atoms other than terephthalic acid, It is desirable to consist of repeating units which consist of a diamine component unit which consists of an aliphatic series diamine component unit and/or an alicycle group diamine component unit. Moreover, as for this aromatic polyamide, it is desirable that the limiting viscosity measured in 25-degree-C concentrated sulfuric acid is within the limits of 0.5 - 3.0 dl/g. As for the polyamide composition of this invention, the following presentation and the (A) fusing point are aromatic polyamide of 290 degrees C or more. 20 to 80 weight %, (B) minerals reinforcement 0 to 60 weight %, (C) brominated flame retardants 5 to 40 weight %, and (D) zinc It is desirable that the sum total of one or more sorts of compounds [0.1 to 10 weight % of] chosen from the included multiple oxide and the zinc salt of phosphoric acid, ********, and (above-mentioned A) +(B)+(C)+ (D) is 100 weight %. Moreover, the fire-resistant aromatic polyamide constituent of this invention is (E) cation adsorption mineral matter to a total of 100 weight parts of (above-mentioned A) +(B)+(C)+ (D). You may contain 0.01 - 10 weight part. Each component which forms hereafter the fire-resistant polyamide composition first applied to this invention is explained.
[0011] (A) In aromatic polyamide this invention, a fusing point (Tm) contains the aromatic polyamide which is 290 degrees C or more. As aromatic polyamide, if Tm is in the above-mentioned range, there will be no restriction in particular, but the following (A) aromatic polyamide is used preferably.
[0012] Especially the above-mentioned (A) aromatic polyamide is (i) although there is no restriction. It consists of a constitutional unit guided from dicarboxylic acid and (ii) diamine, and is (i). The constitutional unit guided from dicarboxylic acid is a constitutional unit guided from terephthalic acid. The constitutional unit guided in% of the amount of 30-100mol from aromatic dicarboxylic acid other than terephthalic acid and/or aliphatic series dicarboxylic acid with 4-20 carbon atoms is included in% of the amount of 0-70mol. (ii) As for the constitutional unit guided from diamine, it is desirable to consist of a constitutional unit guided from alkylene diamine with 4-18 carbon atoms which have normal chain alkylene diamine and/or a side chain alkyl group with 4-18 carbon atoms.
[0013] Although there is no restriction in particular, such aromatic polyamide is usually the quantity of 20 - 80 weight part, and is preferably blended in the quantity of 25 - 70 weight part.
[0014] (i) which forms the aromatic polyamide used by this invention Dicarboxylic acid contains aromatic dicarboxylic acid as an essential ingredient, and is desirable as aromatic dicarboxylic acid (i-a). Terephthalic acid is contained.
[0015] Moreover, this (i) Dicarboxylic acid (i-b), In aromatic-dicarboxylic-acid pans other than terephthalic acid (i-c) You may contain aliphatic series dicarboxylic acid.
[0016] (i-b) As aromatic dicarboxylic acid other than terephthalic acid, isophthalic acid, 2-methyl terephthalic acid, naphthalene dicarboxylic acid, these combination, etc. are mentioned, for example.
[0017] (i-c) As aliphatic series dicarboxylic acid, concretely, 2-20 carbon atoms and the aliphatic series dicarboxylic acid which has the alkylene group of 4-12 preferably are mentioned, for example, succinic acid, adipic acid, azelaic acid, sebacic acid, these combination, etc. are mentioned. Among these, adipic acid is desirable.
[0018] Moreover, it is (i) as mentioned above. As for (ii) diamine which forms aromatic polyamide with dicarboxylic acid, it is desirable that it is alkylene diamine with 4-18 carbon atoms which have normal chain alkylene diamine and/or a side chain alkyl group with 4-18 carbon atoms.
[0019] As normal chain alkylene diamine with such 4-18 (ii) carbon atoms, Concretely 1, 4-diamino butane, 1, 6-diamino hexane, 1, 7-diamino heptane, 1, 8-diamino octane, 1, 9-diamino nonane, 1, 10-diamino decane, 1, and 11-diamino undecane, 1, 12-diamino dodecane, the 2-methyl 1, 5-diamino pentane, the 2-methyl 1, 8-diamino octane, these combination, etc. are mentioned. Moreover, as side chain alkylene diamine, the 2-methyl 1, 5-diamino pentane, the 2-methyl 1, 8-diamino octane, etc. are

mentioned preferably.
[0020] 1, 6-diamino hexane, 1, 8-diamino octane, 1, 9-diamino nonane, the 2-methyl 1, and 8-diamino octane are desirable, and 1 and 6-diamino hexane is [among these] especially desirable.
[0021] This aromatic polyamide resin is the above constitutional units (A). You may contain the constitutional unit guided from dicarboxylic acid and diamines other than terephthalic acid.
[0022] [aromatic polyamide] although the aromatic polyamide used by this invention is guided from the dicarboxylic acid and diamine containing the above terephthalic acid constitutional unit (a) guided from terephthalic acid when making into 100mol % the constitutional unit guided from dicarboxylic acid usually -- 30-100mol % -- desirable -- 40-80mol % -- it contains at 45-70mol % still more preferably. constitutional unit (b) guided from aromatic dicarboxylic acid other than terephthalic acid usually, 0-50mol % -- desirable -- 0-40mol % and the constitutional unit (c) which contains in% of the amount of 0-20mol still more preferably, and is guided from aliphatic series dicarboxylic acid usually -- 0-70mol % -- desirable -- 20-60mol % -- it is 30-55mol % still more preferably.
[0023] Moreover, the aromatic polyamide used by this invention is a constitutional unit guided from above dicarboxylic acid and diamines, Specifically, you may usually contain a little constitutional units guided from polyvalent carboxylic acid of 3 or more basicity, such as trimellitic acid and pyromellitic acid, in the quantity not more than 5 mol %.
[0024] The aromatic polyamide furthermore used by this invention may be the mixture of the aromatic polyamide which is mainly concerned with the constitutional unit guided from the terephthalic acid as dicarboxylic acid, and the aromatic polyamide which is mainly concerned with the constitutional unit guided from the isophthalic acid as dicarboxylic acid.
[0025] As for the aromatic polyamide used by above this inventions, it is desirable for the limiting viscosity [eta] measured in 25-degree C concentrated sulfuric acid to be 0.6 - 2.0 dl/g especially preferably 0.5 to 2.5 dl/g preferably 0.5 to 3.0 dl/g.
[0026] The above aromatic polyamide has a high fusing point, and is 295 degrees C or more preferably 290 degrees C or more. Also among the aromatic polyamide which has such a fusing point, especially the aromatic polyamide 295-330 degrees C of whose fusing points are 300-330 degrees C still more preferably has the outstanding heat-resisting property of 295 degrees C or more. As for the glass transition temperature in the amorphism part of aromatic polyamide, it is still more desirable that it is usually 70 degrees C or more.
[0027] Moreover, since such aromatic polyamide has specific structure as mentioned above, it shows a value low also about absorptivity.
[0028] The heat-resistant polyamide (A) used by this invention is excellent in the heat-resisting property, and 280-380 degrees C of working temperature at the time of compounding and shaping is usually 300-350 degrees C preferably.
(A) It is desirable for sodium content to use as polyamide polyamide which is 500 ppm or less, and it is especially desirable that it is as small sodium content as possible. Such polyamide can adjust quantity of a catalyst and can manufacture it by a well-known method.
[0029] (B) As the minerals reinforcement which may be used if needed by minerals strengthening agent this invention The various inorganic fillers which have form, such as fibrous, powder, a grain, tabular, a needle, a letter of crossing, and mat state, can be used.
[0030] As a minerals strengthening agent, inorganic fiber, such as glass fiber (glass fiber), a potassium titanate fiber, metallic-coating glass fiber, ceramic fiber, UORASUTONAITO, carbon fiber, metallic carbide fiber, metal hardened material fiber, an asbestos fiber, and boron fiber, is mentioned. Especially as such a fibrous bulking agent, glass fiber is desirable. while the moldability of a constituent improves by using glass fiber, the Plastic solid formed from a thermoplastics constituent pulls -- hardness and flexural strength -- it bends and heat-resistant characteristics, such as mechanical properties, such as an elastic modulus, and heat deflection temperature, improve. the average length of the above glass fiber is usually 0.1-20mm in the range of 0.3-6mm preferably -- an aspect ratio -- usually -- 10-2000 -- it is in the range of 30-600 preferably. It is desirable to use the glass fiber which

has average length and an aspect ratio in such within the limits. Such glass fiber is usually the quantity of 0 - 60 weight part, and is preferably blended in the quantity of 5 - 50 weight part.
[0031] As the example of the various fillers which have form used in this invention besides the above-mentioned inorganic fiber-like filler, such as powder, a grain, tabular, a needle, a letter of crossing, and mat state, Silica, silica alumina, alumina, calcium carbonate, titanium dioxide, Needlelike inorganic compounds, such as an inorganic compound powdery [, such as a talc, straw SUTONAITO, a diatom earth, Clay kaolin, spherical glass, mica, gypsum, red ocher, magnesium oxide and zinc oxide,] or tabular and potassium titanate, can be mentioned.
[0032] Two or more sorts can also use these fillers, mixing. Moreover, these fillers can also be processed and used by the silane coupling agent or a titanium coupling agent. For example, the surface treatment may be carried out with the Silang system compounds, such as vinyltriethoxysilane, 2-aminopropyl triethoxysilane, and 2-glycidoxy propyltriethoxysilane. In addition, the mean particle diameter of such a filler is usually 0.1-200 micrometers within the limits of 1-100 micrometers preferably. Among these, glass fiber is used preferably. In the combustion test which the polyamide composition of this invention does according to UL94 specification, if evaluation is V-0 and Na ion measured by induction plasma emission spectrometry is 400 ppm or less, restriction in particular will not be carried out, but it is desirable to use a flame retarder. The following flame retarders of (c) are desirable also especially in it.
[0033] (C) In order to give fire retardancy by brominated-flame-retardants this invention, brominated flame retardants can be used, for example and bromination polystyrene, Pori (bromination styrene), bromination polyphenylene ether, etc. are mentioned as brominated flame retardants used.
[0034] As such bromination polystyrene, Pori dibromo styrene, Pori tribromo styrene, the Pori PENTA bromostyrene, Pori tribromo alpha-methylstyrene, etc. are mentioned concretely.
[0035] When the above bromination polystyrene brominates polystyrene or Pori alpha-methylstyrene, Pori (bromination styrene) is manufactured by polymerizing bromination styrene or bromination alpha-methylstyrene.
[0036] Moreover, in this invention, the following bromine content compounds can also be used as brominated flame retardants (C). Hexabromobenzene, penta-bromoethyl benzene, hexabromobiphenyl, Deca bromo diphenyl, hexa bromo diphenyloxide, OKUTA bromo diphenyloxide, deca bromo diphenyloxide, tetrabromobisphenol A, and tetrabromobisphenol A-screw (hydroxy ethyl ether), A tetrabromobisphenol A-screw (2, 3-dibromopropyl ether), Tetrabromobisphenol A derivatives, such as a tetrabromobisphenol A-screw (bromo ethyl ether) and a tetrabromobisphenol A-screw (allyl compound ether), Tetrabromo bisphenol S and a tetrabromo bisphenol S-screw (hydroxy ethyl ether), Tetrabromo bisphenol S derivatives, such as a tetrabromo bisphenol S-screw (2, 3-dibromopropyl ether), Tetrabromo phthalic anhydride derivatives, such as tetrabromo phthalic anhydride, tetrabromo phthalimide, and ethylene screw tetrabromo phthalimide, An ethylene screw (5, 6-dibromo norbornane 2 and 3 - dicarboxyimide), tris (2, 3-dibromopropyl 1)-isocyanurate, The Diels ARUDA addition product of hexa bromo cyclopentadiene, tribromo phenyl glycidyl ether, Tribromo phenyl acrylate, ethylene screw tribromo phenyl ether, Ethylene screw pentabromophenyl, ethylene screw pentabromophenyl ether, Tetra-DEKABUROMOJI phenoxy benzene, bromination polyphenylene oxide, brominated epoxy resin, bromination polycarbonate, PORIPENTA bromo benzyl acrylate, OKUTA bromo naphthalene, PENTA bromo cyclohexane, hexa bromo cyclo dodecane, a screw (Tribromo phenyl) Fumaric amide, N-methyl hexa bromo diphenylamine, etc. are mentioned.
[0037] Two or more sorts of these brominated flame retardants can be combined, and they can also be used. Bromination polystyrene and Pori (bromination styrene) are used preferably among these. Such brominated flame retardants are usually 100 or less weight % of quantity, are 5 to 40weight % of quantity preferably, and are blended in 10 to 35weight % of quantity still more preferably. (D) It is desirable for sodium content to use what is 300 ppm or less as brominated flame retardants, and it is especially desirable that it is as small sodium content as possible. Although such a flame retarder is marketed, it can be chosen from inside.

[0038] (D) In multiple oxide this invention containing zinc, fire retardancy can be raised using the multiple oxide which contains zinc, for example. "The multiple oxide containing zinc" preferably used by this invention although a multiple oxide is an oxide with which two or more sorts of metals live together, (1) The zinc salt of the oxide with which the above of zinc and the element (B, aluminum, Ga, Tl, C, Si, germanium, Sn, Pb) of the 13th group of the periodic table or the 14th group lives together, (2) molybdic acid, or tungstic acid can be raised. As the multiple oxide containing zinc The compound which has a presentation on ** and an oxide basis has it, and The inside of ZnO-xMOm/2, and a yH2O type, [desirable] M expresses the 13th group element of the periodic table, or the 14th group element, m expresses the valence of Element M, x is the number of 0.2-3, and y is used in that the compound which is the number of 0-4 and which is come out of and expressed is independent, or two or more sorts of combination. As the 13th group element, boron is suitable, and tin is suitable as the 14th group element. For example, Zn(s) [Sn(OH)6], such as ZnSnO3, etc. are mentioned also in the stannate expressed with ZnO-xSnO2 and yH2O. Moreover, the borate expressed with ZnO-xB2O3 and yH2O and the zinc borate specifically expressed with 2ZnO and 3 B-2 O3, 4ZnO, B-2O3andH2O, and 2ZnO and 3 B-2O3.3.5H2O are mentioned. Moreover, the zinc salt of molybdic acid or tungstic acid other than the compound of the above-mentioned presentation can also be used. These are salts which consist of molybdenum oxide, tungstic oxide, and zinc oxide, for example, can be manufactured by the method of dissolving molybdenum oxide and zinc oxide. For example, the compound of molybdic acid calcium zinc, basic molybdic acid zinc, high efficiency molybdic acid zinc, and a magnesium silicate etc. is raised. These are marketed. Apart from the multiple oxide of the above-mentioned zinc, the zinc salt of phosphoric acid can also be used as (D). The amount of addition of the multiple oxide containing such zinc that may be used by this invention is 1 to 8weight % of quantity preferably 0.1 to 10weight %. Fire retardancy of these improves by using together with brominated flame retardants. Moreover, the processing stability of a constituent is also good. Moreover, when the multiple oxide containing zinc is used together with antimony compounds, such as sodium antimonate and antimony oxide, the quantity of an antimony compound is that the quantity of the multiple oxide containing zinc does not use together still more preferably 30% or less preferably 50% or less. The content of the sodium ion in a constituent seems of course, not to exceed 400 ppm.

[0039] (E) Although the ion adsorption mineral matter which may be used by cation adsorption mineral matter this invention is classified into the inorganic ion exchanger which takes in the ion of the adsorbate which only adsorbs an ion etc., and an opposite charge, or performs ion exchange, it has some which it has in accordance with both. The adsorbate of cation adsorption mineral matter is mineral matter which performs a mass transfer from a liquid and a solid using adsorbent [of a porous solid], and separates an ion. In order to raise inorganic substances, such as a stratified compound excellent in a heat-resisting property and ******-proof, activated carbon, zeolite, permutite, the Thilly power gel, activated alumina, activated clay, etc. and to heighten adsorption capacity power, porosity-izing and the thing which carried out pulverization and raised the specific surface area are desirable. An inorganic ion exchanger is mineral matter which performs a mass transfer from a liquid and a solid by the structure of cation adsorption mineral matter, and the ion exchange ability which originates in composition and is produced, and separates an ion. For example, a part of Si of silica structure replaces by aluminum, it is having three-dimensional structure, and since aluminum is trivalence, aluminosilicate condensation type zeolite serves as an anion, it can incorporate a cation and can be neutralized. That grain surface is covered by the silanol group, and this silanol carries out ion dissociation very slightly, takes out a hydrogen ion with a silica gel, and shows cation exchange ability with it. Since an inorganic ion exchanger has adsorbent [of ion adsorption mineral matter], and ion exchange ability, it is more excellent in the field of ion capture. As an inorganic ion exchanger Montmorillonite, such as aluminosilicate condensation type zeolite, a silica gel, and activated clay, IXE-600 which is antimony and a pith mass system compound (product made from Toagosei Chemical industry), IXE-700 (product made from Toagosei Chemical industry) which is magnesium and an aluminium system compound, IXE-100 (product made from Toagosei Chemical industry)

which are a zirconium system compound, IXE-400 (product made from Toagosei Chemical industry) of a titanium system, etc. are illustrated. Cation adsorption mineral matter may be independent, or two or more kinds may be used together and it may be used. The inorganic ion exchanger which shows cation exchange ability is desirable. the case where such cation adsorption mineral matter is used -- 0.01 - 10 weight part -- it is 0.05 - 8 weight part preferably. Electric insulation becomes still higher when cation adsorption mineral matter is used.

[0040] In this invention, you may put in (F) denaturation polyolefine if needed. By adding denaturation polyolefine, a drip can be prevented further. As (F) denaturation polyolefine which can be used arbitrarily, (F-1) Denaturation polyolefines, such as modified polyethylene (F-2), a denaturation aromatic vinyl compound and a conjugated diene copolymer, or its hydride, such as Denaturation SEBS, (F-3) Denaturation polyolefin elastomers, such as denaturation ethylene propylene rubber, etc. are mentioned, for example, you may add arbitrarily [it is more desirable and] in 0.1 to 8weight % of quantity 0.1 to 10weight %.

[0041] The fire-resistant polyamide composition concerning other component this inventions, In the range which does not spoil the purpose of this invention in addition to each above component, heat-resistant stabilizers other than the above, Inorganic compounds, such as a weathering stabilizer, a plasticizer, a thickener, an antistatic agent, a release agent, a pigment, a color, inorganic matter or an organic bulking agent, a nucleating additive, a fiber reinforcer, carbon black, a talc, Clay, and mica, etc. may contain the well-known compounding agent variously. In addition, additives, such as a halogen scavenger usually used, can also be used in this invention. As a halogen scavenger, the hide ROTARU site is known, for example.

[0042] A heat-resisting property, fire retardancy, rigidity, tensile strength, flexural strength, and impact strength of the fire-resistant polyamide composition concerning especially this invention improve further by containing the fiber reinforcer among the above.

[0043] The fire-resistant polyamide composition furthermore applied to this invention, In the range which does not spoil the purpose of this invention, may contain other polymers and as such other polymers For example, polyethylene, polypropylene, Pori 4-methyl 1 - Pentene, Ethylene and 1-butene copolymer, a propylene ethylene copolymer, propylene and 1-butene copolymer, Polyolefines, such as a polyolefin elastomer, polystyrene, polyamide, polycarbonate, polyacetal, polysulfone, polyphenylene oxide, a fluororesin, silicone resin, etc. are mentioned.

[0044] For manufacturing the fire-resistant polyamide composition applied to this invention from each above component, Each component that what is necessary is just to adopt the well-known resin kneading method A Henschel mixer, What is necessary is just to adopt granulation or the method of pulverizing as the method of mixing with V blender, a ribbon blender, a tumbler blender, etc., or a mixed back pan after fusion kneading with a 1 axis extruder, a multi-screw extruder, a kneader, a Banbury mixer, etc. In this invention, a constituent is prepared so that the quantity of the sodium ion measured by induction plasma emission spectrometry may be set to 400 ppm or less using each above component. In the combustion test which performs the constituent concerning this invention according to UL-94 specification, evaluation is V-0. Moreover, also while the quantity of the sodium ion measured by induction plasma emission spectrometry is 400 ppm or less, as for the constituent concerning this invention, it is desirable that it is 100 ppm or less especially preferably 200 ppm or less. If it is this range, since the fall of the electric insulation under high-humidity/temperature is small, it is desirable.

[0045]

[Effect of the Invention] Even if electricity and electronic parts, such as a connector fabricated using the fire-resistant polyamide composition which excels [polyamide composition / of this invention] in the stability at the time of shaping, and is applied to this invention, are excellent in fire retardancy and are used under high-humidity/temperature, its fall of electric insulation is small.

[0046]

[Example] Next, this invention is not limited by these work examples although a work example

explains this invention concretely.
[0047] Each following component was used in the following work examples and comparative examples.
(A) Heat-resistant polyamide [acid component -- 55mol of terephthalic acid % and 45mol of adipic acid %, a diamine component -- 1, 6-diamino hexane 100 mol %, limiting viscosity [eta] -- 1.0 dl/g (concentrated sulfuric acid, 25 degrees C)
Fusing point -- 310degree-C]
The amount of sodium ion: 260 ppm (B) glass fiber (product CSmade from Asahi fiberglass 03JAFT2A)
(C) Bromination polystyrene (MANAC PRF-1200ZEX) and Pori bromination styrene (PDBS80 made from GLC) were used by three sevenths of bulk densities.
(D) The multiple oxide containing zinc (zinc borate Firebreak500 made from BORAKKUSU, Nihon Kagaku Sangyo stannic acid zinc)
(E) Cation adsorbate (product IXEmade from Toagosei chemistry-100)
Tough [as drip prevention at the time of combustion]-in addition to the above tech M1913 by Asahi Chemical which is Male Inn-ized SEBS As 1 weight part and a halogen catcher Product hide ROTARU site DHTmade from Kyowa chemical industry-4C It is Clariant Japan HOSUTAMONTOCaV102 as 0.3 weight part and a release agent. 0.3 weight part was added.
[0048] work examples 1-4 -- it mixed by the quantitative ratio as shown in Table 1, and it inserted in the extruder with a 2 axis vent set as the temperature of 310 degrees C, fusion kneading was carried out, and each above component was pelletized.
[0049] Combustion test (UL-94 specification): With the screw win line type injection molding machine set as the temperature of 320 degrees C, it fabricated with the tool temperature of 120 degrees C, the piece of a combustion test (1/32 inch x1/2 x5 inch) was obtained, and the perpendicular type combustion test (UL-94 specification) was done.
The fixed quantity of the amount of sodium ion: Cool for 5 minutes by liquid nitrogen, and a grinding mill grinds the obtained pellet 10g for 3 minutes (specifically, it ground for 3 minutes using the freezer mill 6700 by SPEX). 50g of ion exchange water puts the grinding pellet 10g weighed precisely into the autoclave made from stainless steel, and it heats at 100 degrees C for 24 hours. The grinding pellet was filtered and the induction plasma emission spectral analysis (ICP) analyzed the amount of sodium ion for filtrate.
[0050] using a surface resistance profit **** pellet, a 0.8-mm-thick specimen is fabricated and 500V is impressed for 1 minute by inter-electrode [3mm of]. Measurement was performed after making it absorb moisture for 11 days with an absolute dry condition and 40 degrees C, and 95% relative humidity. A result is shown in Table 1.
[0051] It examined like the work example 1 except having used sodium antimonate instead of comparative example 1 zinc borate, and having used NaV101 instead of CaV102. A result is shown in Table 1.
[0052] Instead of a comparative example 1 hide ROTARU site, it is sodium phosphate (Ferro UV-CHEK AM-595). 0.7 weight part was examined like the work example 1 except having used NaV101 instead of CaV102. A result is shown in Table 1.
[0053]
[Table 1]

	実施例１	実施例２	実施例３	実施例４	比較例１	比較例２
(A) 耐熱性ポリアミド	４２	４２	４２	４２	４２	４２
(B) ガラス繊維	３０	３０	３０	３０	３０	３０
(C) 臭素系難燃剤	２４	２４	２４	２４	２４	２４
(D) ホウ酸亜鉛	４	－	４	－	－	－
錫酸亜鉛	－	４	－	４	－	－
(E) ＩＸＥ－１００	－	－	４	４	－	－
アンチモン酸ソーダ	－	－	－	－	４	４
燃焼性試験	Ｖ－０	Ｖ－０	Ｖ－０	Ｖ－０	Ｖ－０	Ｖ－０
ナトリウムイオン量	１４０	１３０	２０	１０	４５０	２３００
表面抵抗（絶乾）	3×10^{15}	2×10^{15}	4×10^{15}	8×10^{15}	3×10^{15}	4×10^{15}
表面抵抗（吸湿後）	3×10^{12}	8×10^{12}	1×10^{13}	5×10^{13}	7×10^{11}	3×10^{10}

[Translation done.]